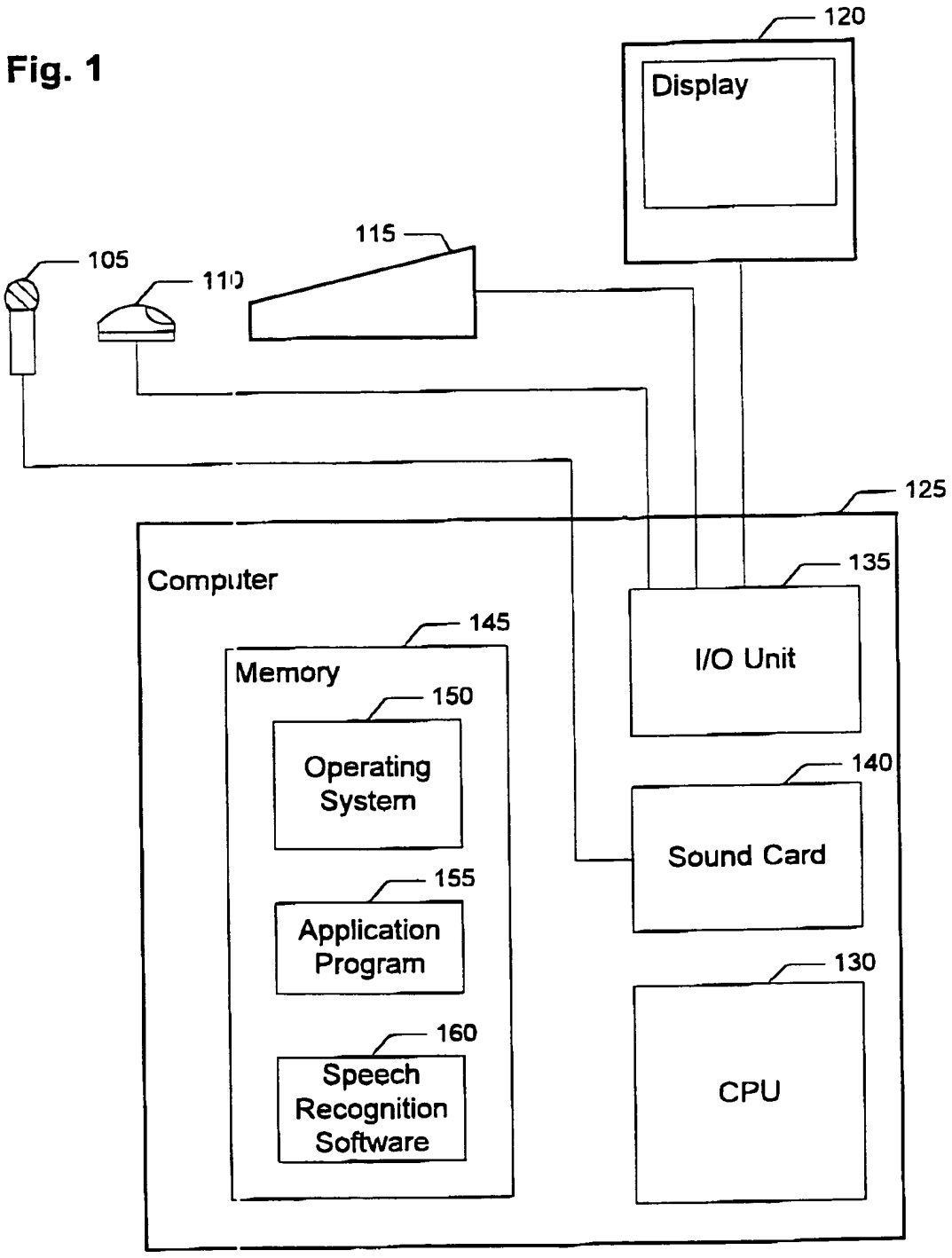
Fig. 1



Figs. 23

23 FIGS

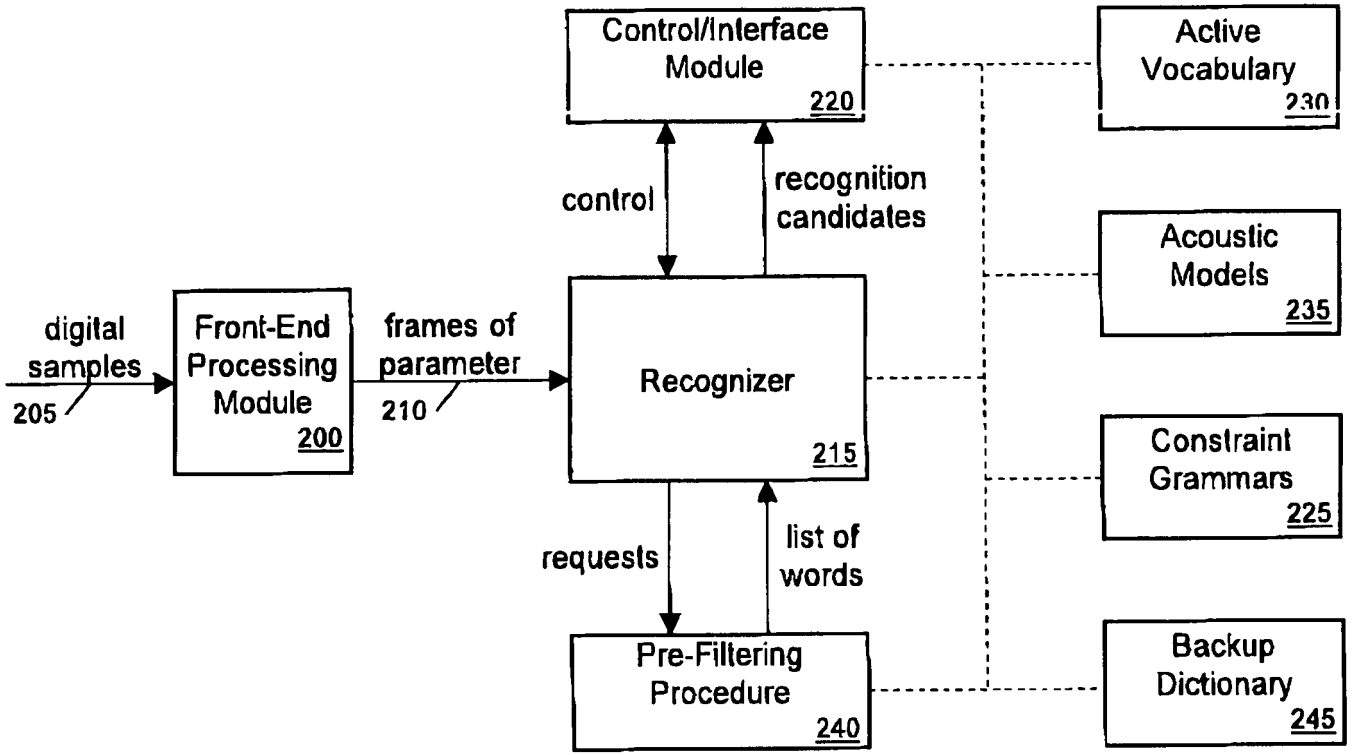

Control/Interface Module
220
Active Vocabulary
230
control
recognition candidates
Acoustic Models
235
digital samples
205
Front-End Processing Module
200
frames of parameter
210
Recognizer
215
Constraint Grammars
225
requests
list of words
Pre-Filtering Procedure
240
Backup Dictionary
245

Fig. 2

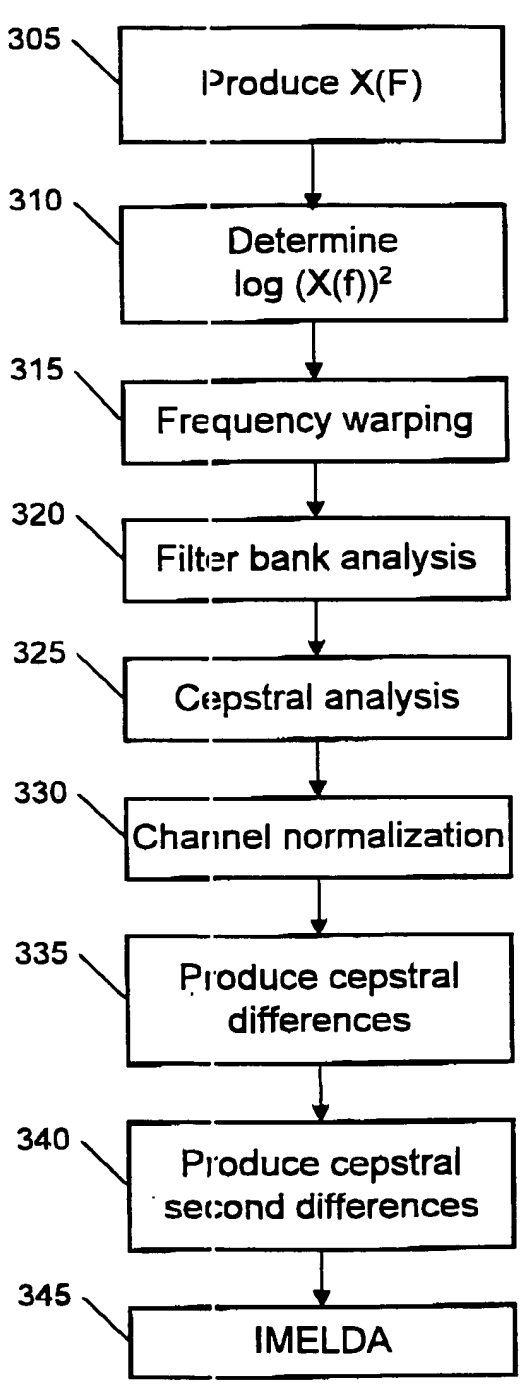

300
305
Produce X(F)
310
Determine
log (X(f))²
315
Frequency warping
320
Filter bank analysis
325
Cepstral analysis
330
Channel normalization
335
Produce cepstral
differences
340
Produce cepstral
second differences
345
IMELDA

Fig. 3

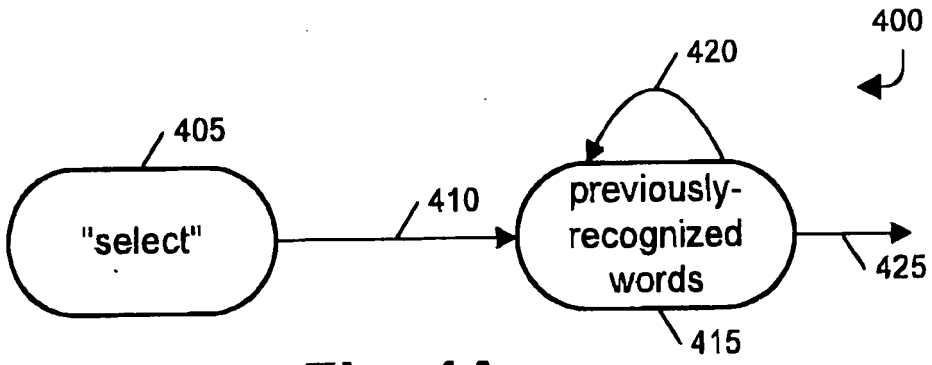

400
420
405
410
"select"
previously-recognized words
425
415

Fig. 4A

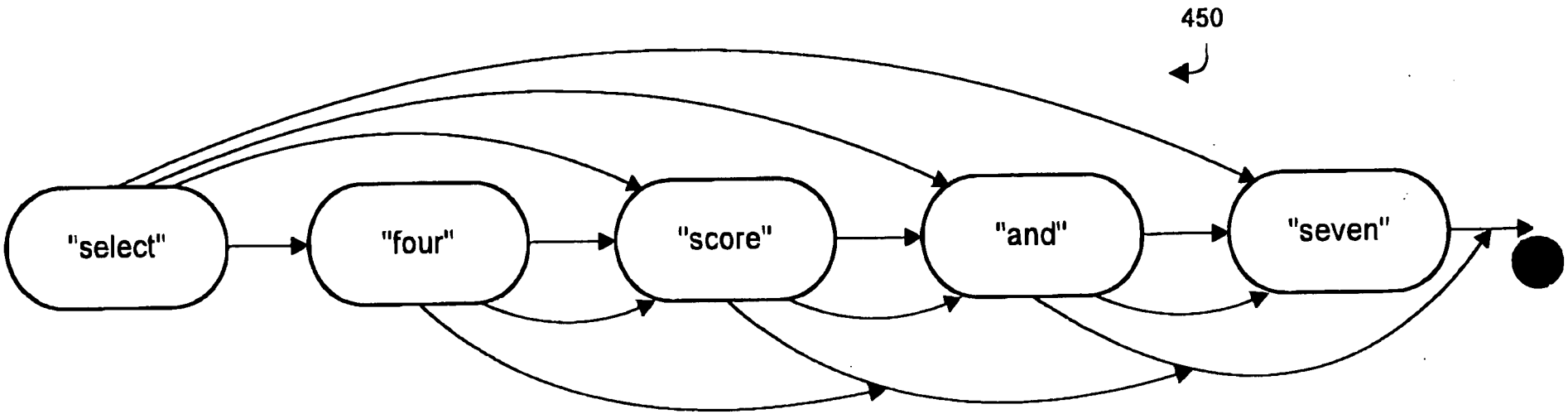

450
"select"
"four"
"score"
"and"
"seven"

Fig. 4B

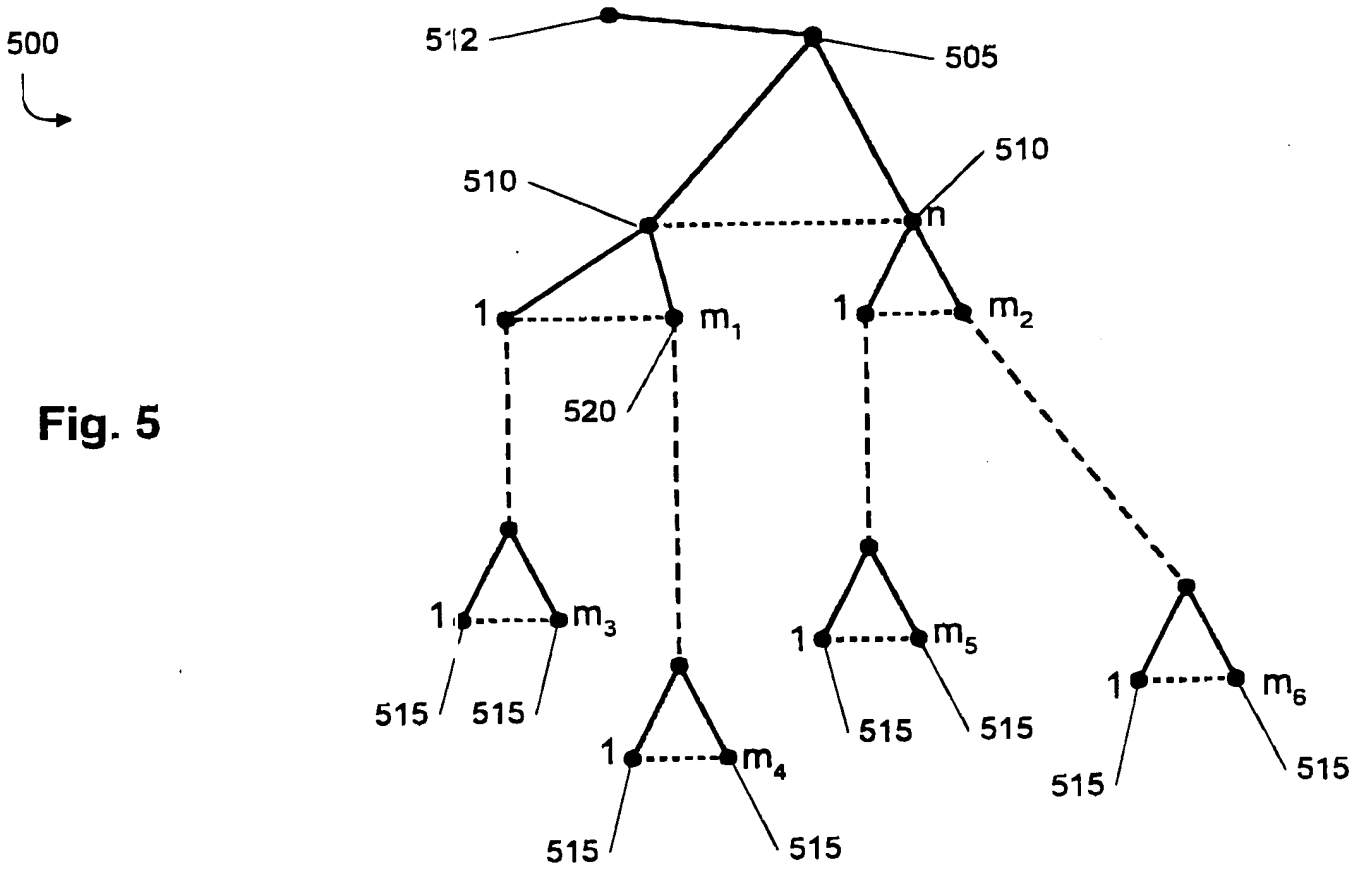


Fig. 5

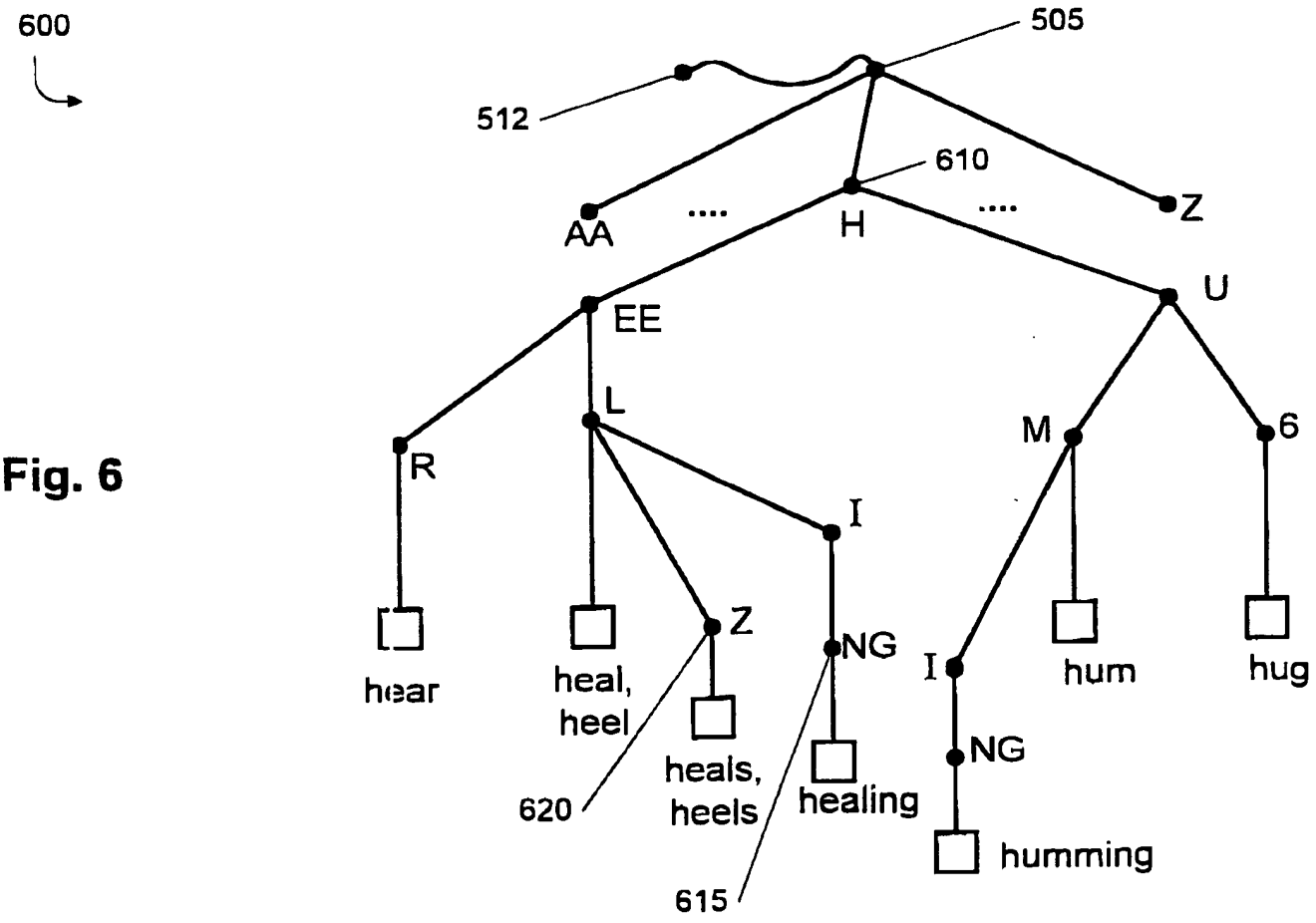

600
505
512
610
AA
....
H
....
Z
EE
U
L
R
M
6
I
Z
NG
I
hear
heal,
heel
hum
hug
620
heals,
heels
healing
NG
humming
615

Fig. 6

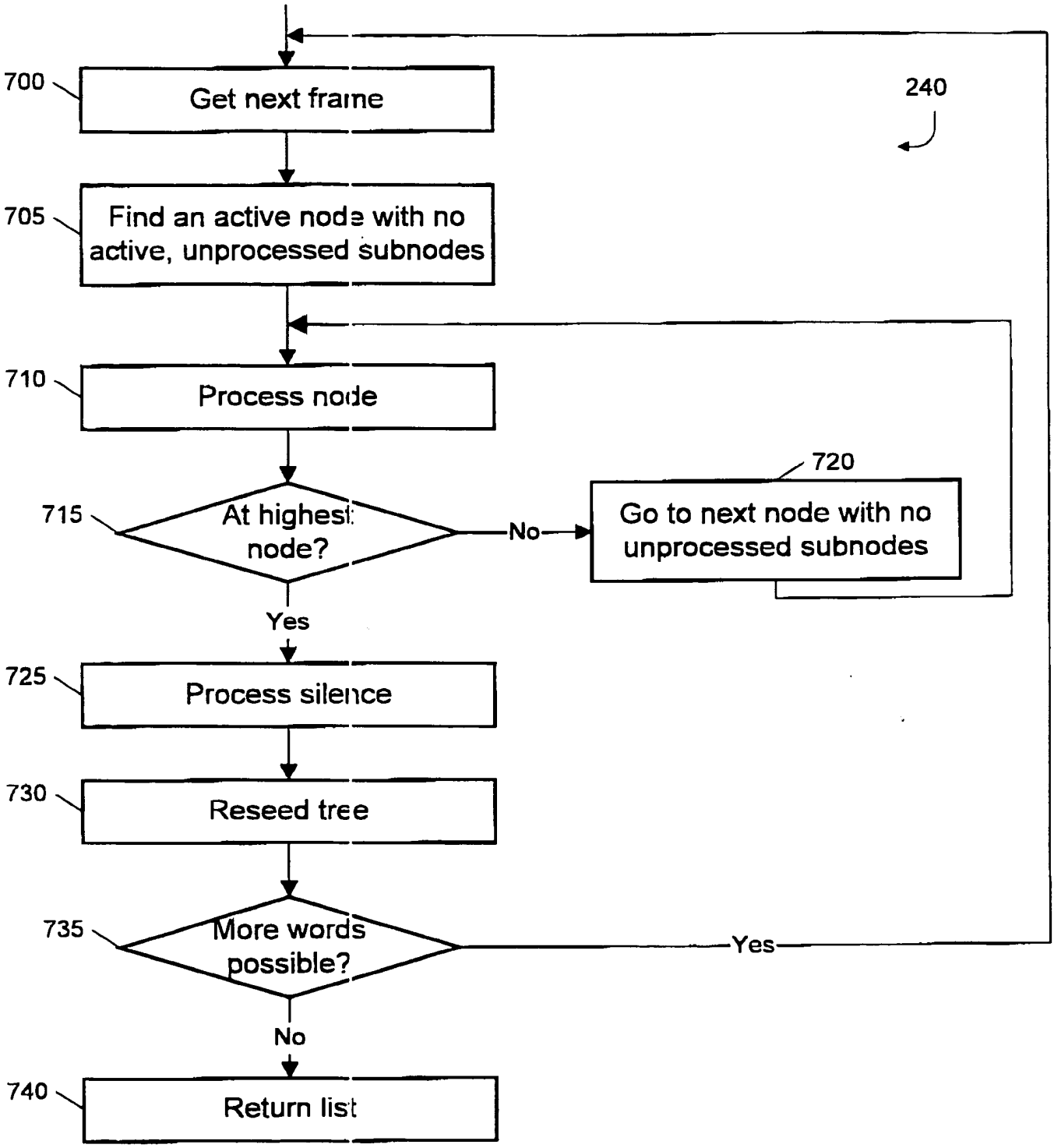

700
Get next frame
240
705
Find an active node with no active, unprocessed subnodes
710
Process node
720
715
At highest node?
No
Go to next node with no unprocessed subnodes
Yes
725
Process silence
730
Reseed tree
735
More words possible?
Yes
No
740
Return list

Fig. 7

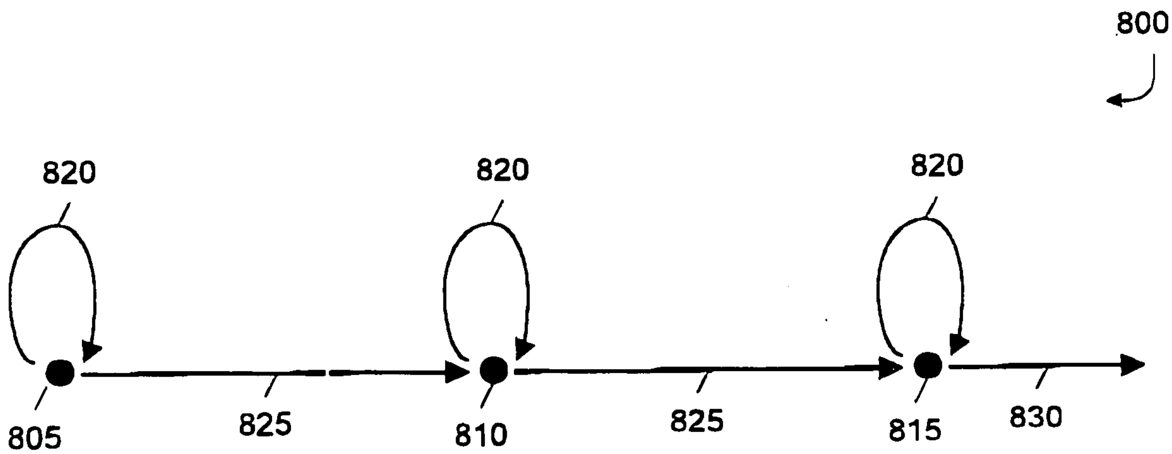


Fig. 8A

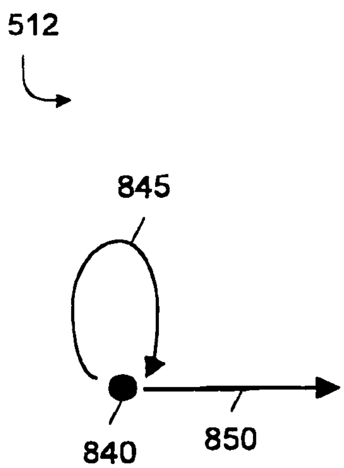


Fig. 8B

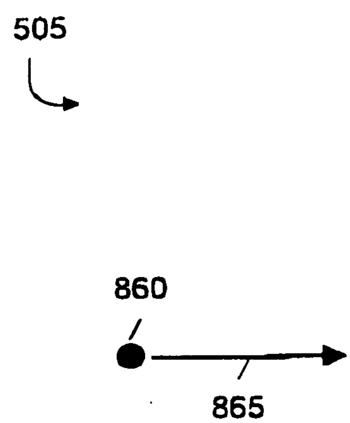


Fig. 8C

Frame	840 ("A")	805 ("B")	810 ("C")	815 ("D")	Next Node ("N")
900 — 0	0	-----	-----	-----	-----
905 — 1	$S_{A1}=A_{A1}$	$S_{B1}=A_{B1}$	-----	-----	-----
910 — 2	$S_{A2}=S_{A1}+A_{A2}$	$S_{B2}=\min(S_{B1}+stay_B, S_{A1})+A_{B2}$	$S_{C2}=S_{B1}+leave_B+A_{C2}$	-----	-----
915 — 3	$S_{A3}=S_{A2}+A_{A3}$	$S_{B3}=\min(S_{B2}+stay_B, S_{A2})+A_{B3}$	$S_{C3}=\min(S_{C2}+stay_C, S_{B2}+leave_B)+A_{C3}$	$S_{D3}=S_{C2}+leave_C+A_{D3}$	-----
920 — 4	$S_{A4}=S_{A3}+A_{A4}$	$S_{B4}=\min(S_{B3}+stay_B, S_{A3})+A_{B4}$	$S_{C4}=\min(S_{C3}+stay_C, S_{B3}+leave_B)+A_{C4}$	$S_{D4}=\min(S_{D3}+stay_D, S_{c3}+leave_C)+A_{D4}$	$S_{N4}=S_{D2}+leave_D+A_{D4}$
925 — n	$S_{An}=S_{An-1}+A_{An}$	$S_{Bn}=\min(S_{Bn-1}+stay_B, S_{An-1})+A_{Bn}$	$S_{Cn}=\min(S_{Cn-1}+stay_C, S_{Bn-1}+leave_B)+A_{Cn}$	$S_{Dn}=\min(S_{Dn-1}+stay_D, +S_{cn-1}+leave_C)+A_{Dn}$	$S_{NN}=\min(S_{Nn-1}+stay_M, S_{Mn-1}+leave_M)+A_{Nm}$

Fig. 9

Frame	810 ("A")	805 ("B")	810 ("C")	815 ("D")	Next Node ("N")
900 — 0	$S_{AO}=0$	-----	-----	-----	-----
905 — 1	$S_{A1}=f(S_{AO}, A_{A1})$	$S_{B1}=f(S_{AO}, A_{B1})$	-----	-----	-----
910 — 2	$S_{A2}=f(S_{A1}, A_{A2})$	$S_{B2}=f(S_{B1}, stay_B, S_{A1}, A_{B2})$	$S_{C2}=f(S_{B1}, leave_B, A_{C2})$	-----	-----
915 — 3	$S_{A3}=f(S_{A2}, A_{A3})$	$S_{B3}=f(S_{B2}, stay_B, S_{A2}, A_{B3})$	$S_{C3}=f(S_{C2}, stay_C, S_{B2}, leave_B, A_{C3})$	$S_{D3}=f(S_{C2}, leave_C, A_{D3})$	-----
920 — 4	$S_{A4}=f(S_{A3}, A_{A4})$	$S_{B4}=f(S_{B3}, stay_B, S_{A3}, A_{B4})$	$S_{C4}=f(S_{C3}, stay_C, S_{B3}, leave_B, A_{C4})$	$S_{D4}=f(S_{D3}, stay_D, S_{c3}, leave_C, A_{D4})$	$S_{N4}=f(S_{D3}, leave_D, A_{D3})$
925 — n	$S_{An}=f(S_{An-1}, A_{An})$	$S_{Bn}=f(S_{Bn-1}, stay_B, S_{An-1}, A_{Bn})$	$S_{Cn}=f(S_{Cn-1}, stay_C, S_{Bn-1}, leave_B, A_{Cn})$	$S_{Dn}=f(S_{Dn-1}, stay_D, S_{cn-1}, leave_C, A_{Dn})$	$S_{Nn}=f(S_{Dn-1}, leave_N, A_{Nn})$

Fig. 10

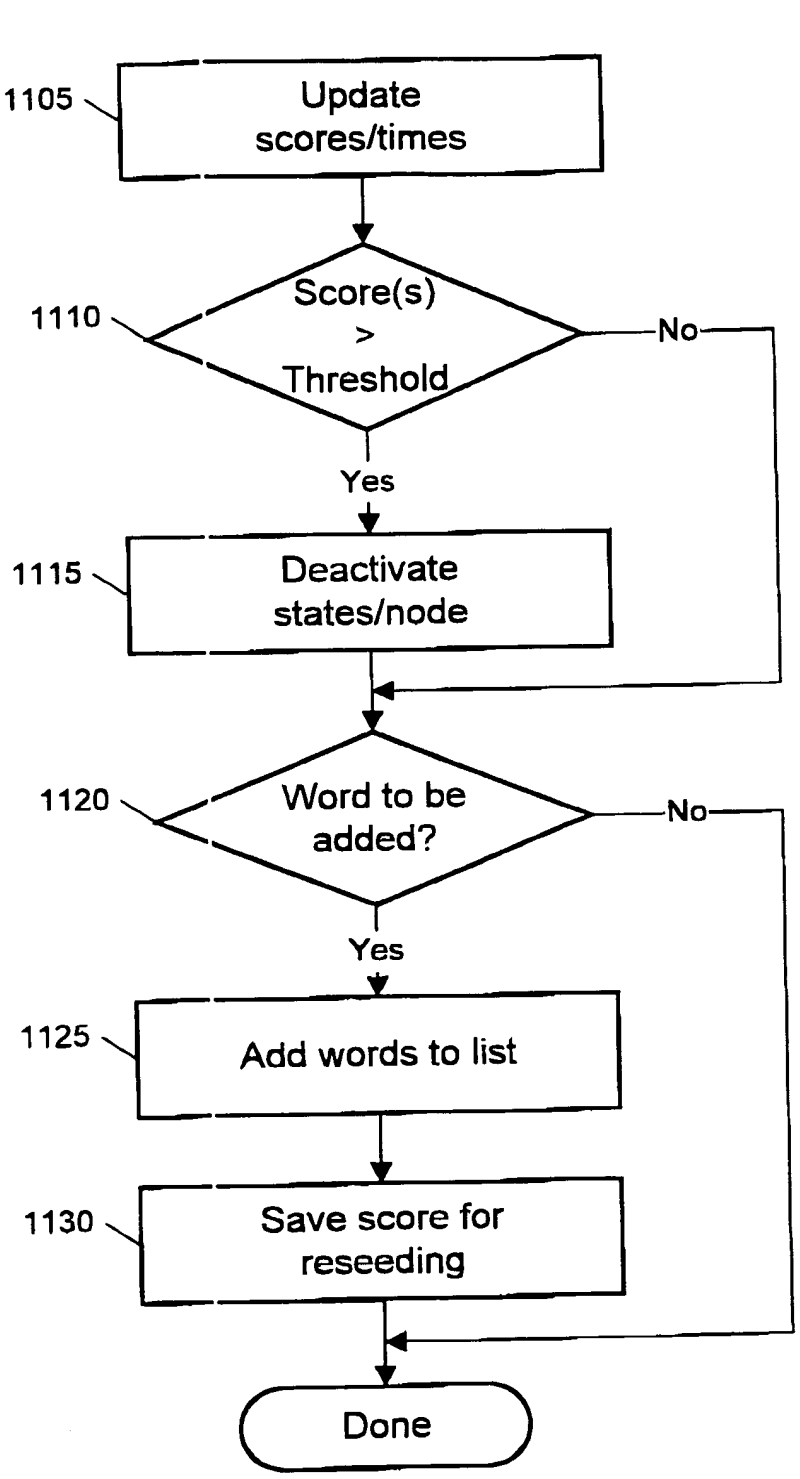

1100
1105
Update scores/times
1110
Score(s) > Threshold
No
Yes
1115
Deactivate states/node
1120
Word to be added?
No
Yes
1125
Add words to list
1130
Save score for reseeding
Done

Fig. 11

Fig. 12

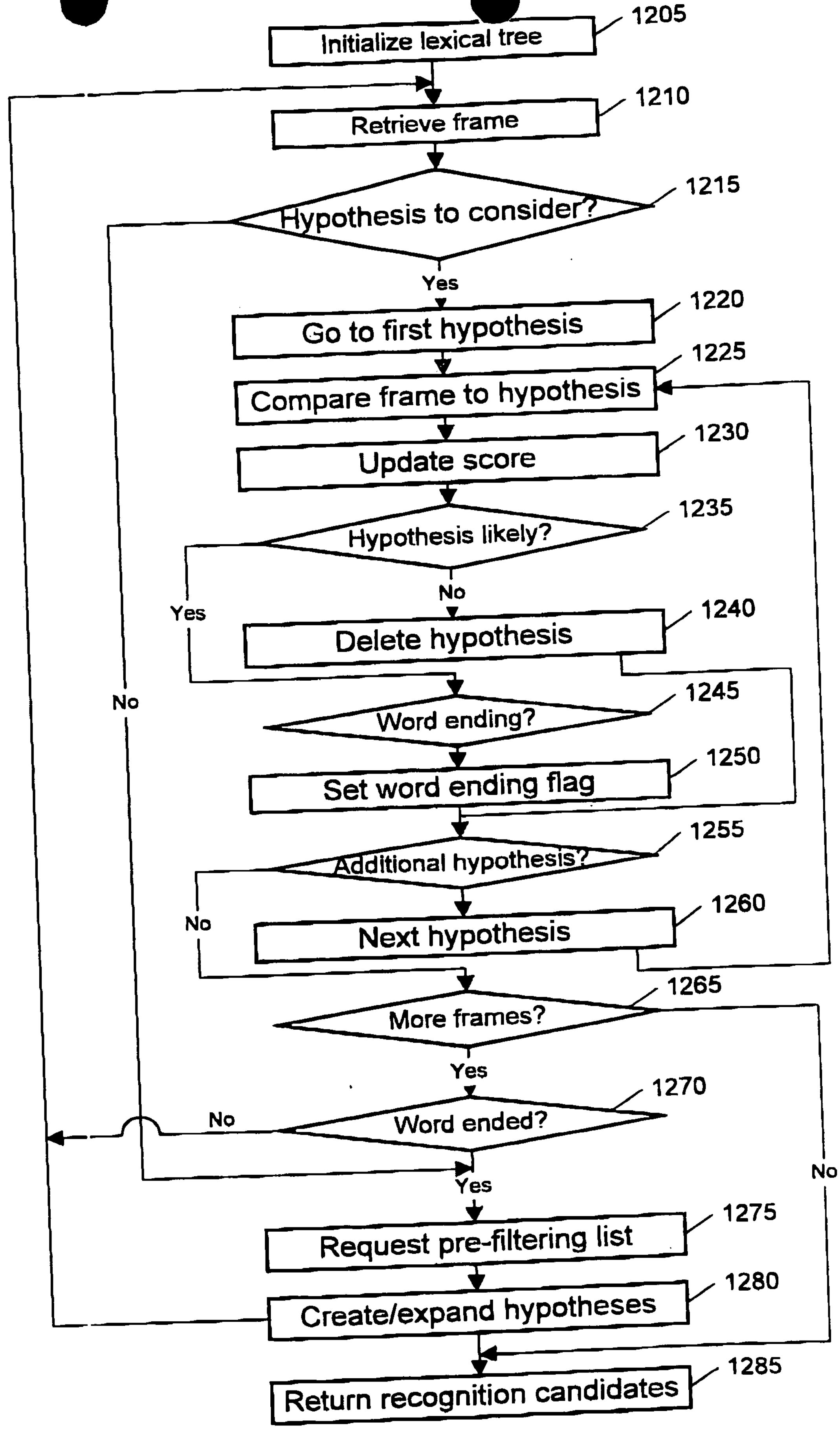


Fig. 13

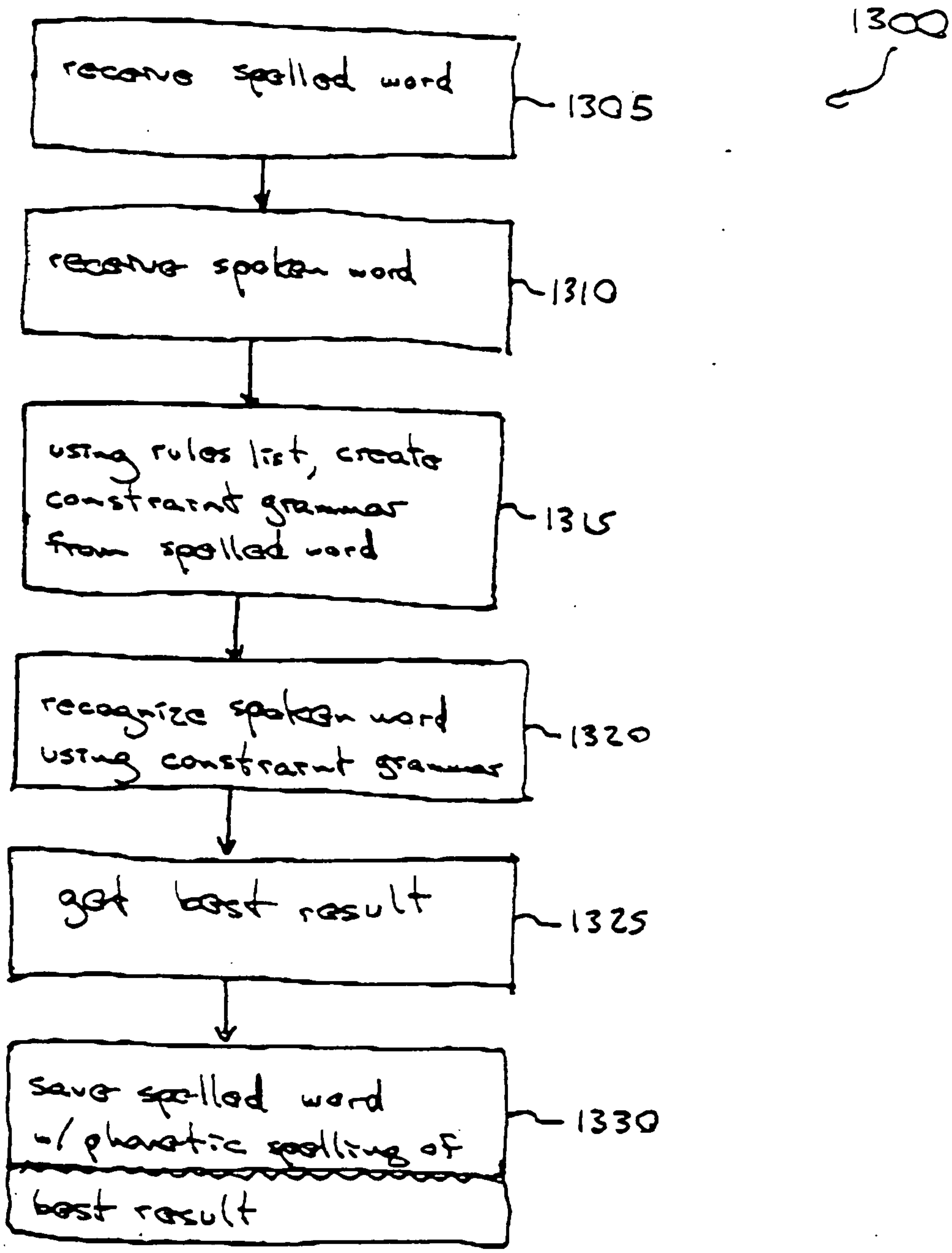


Fig. 14

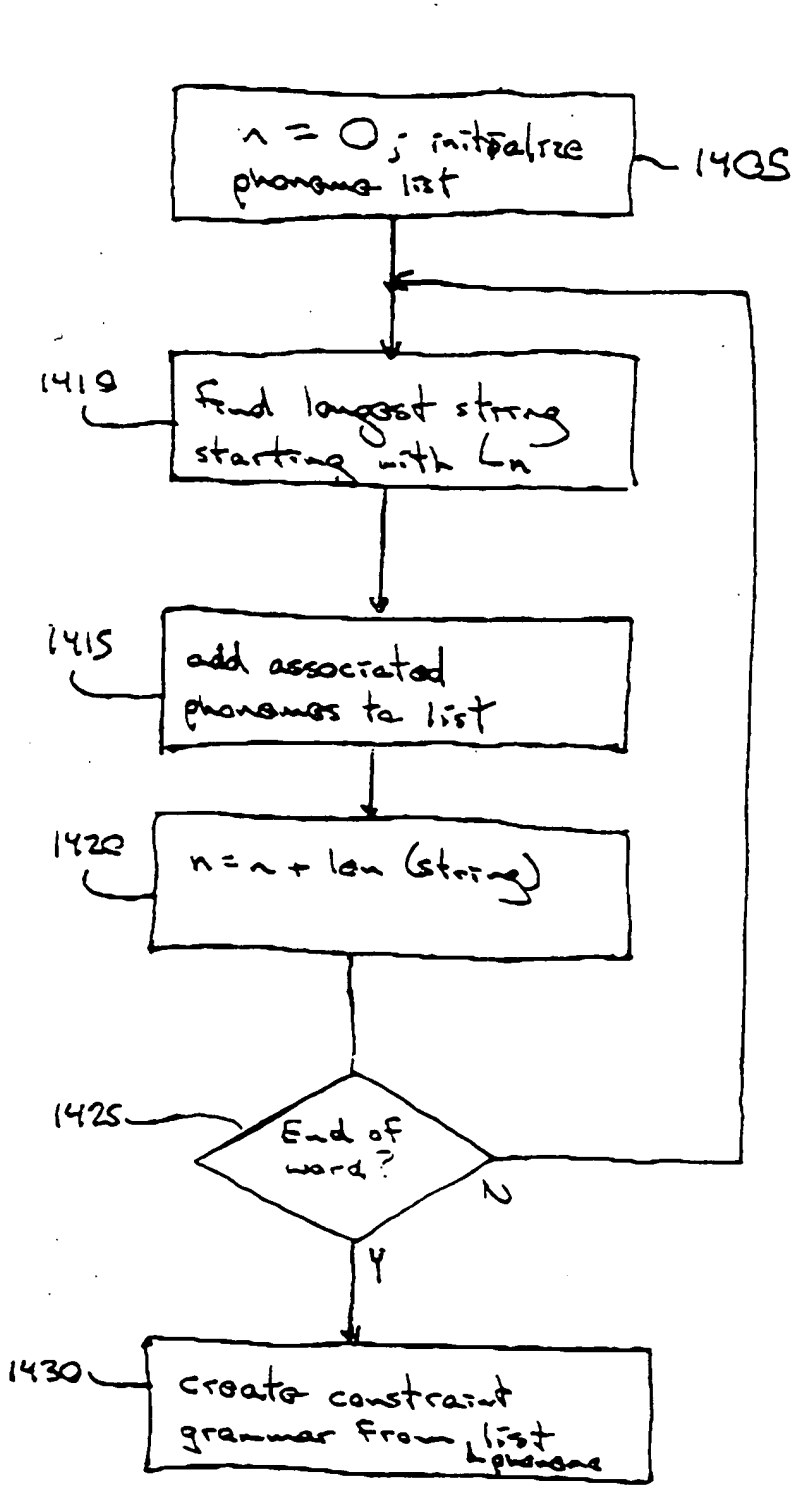
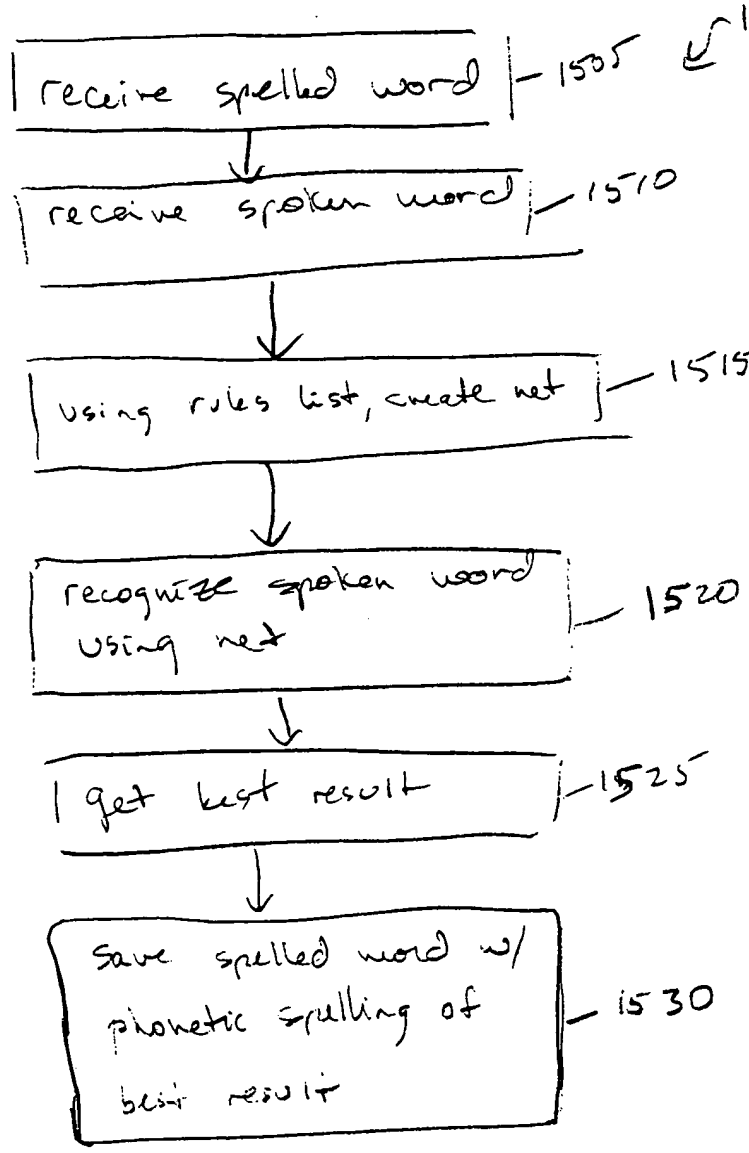


Fig. 15



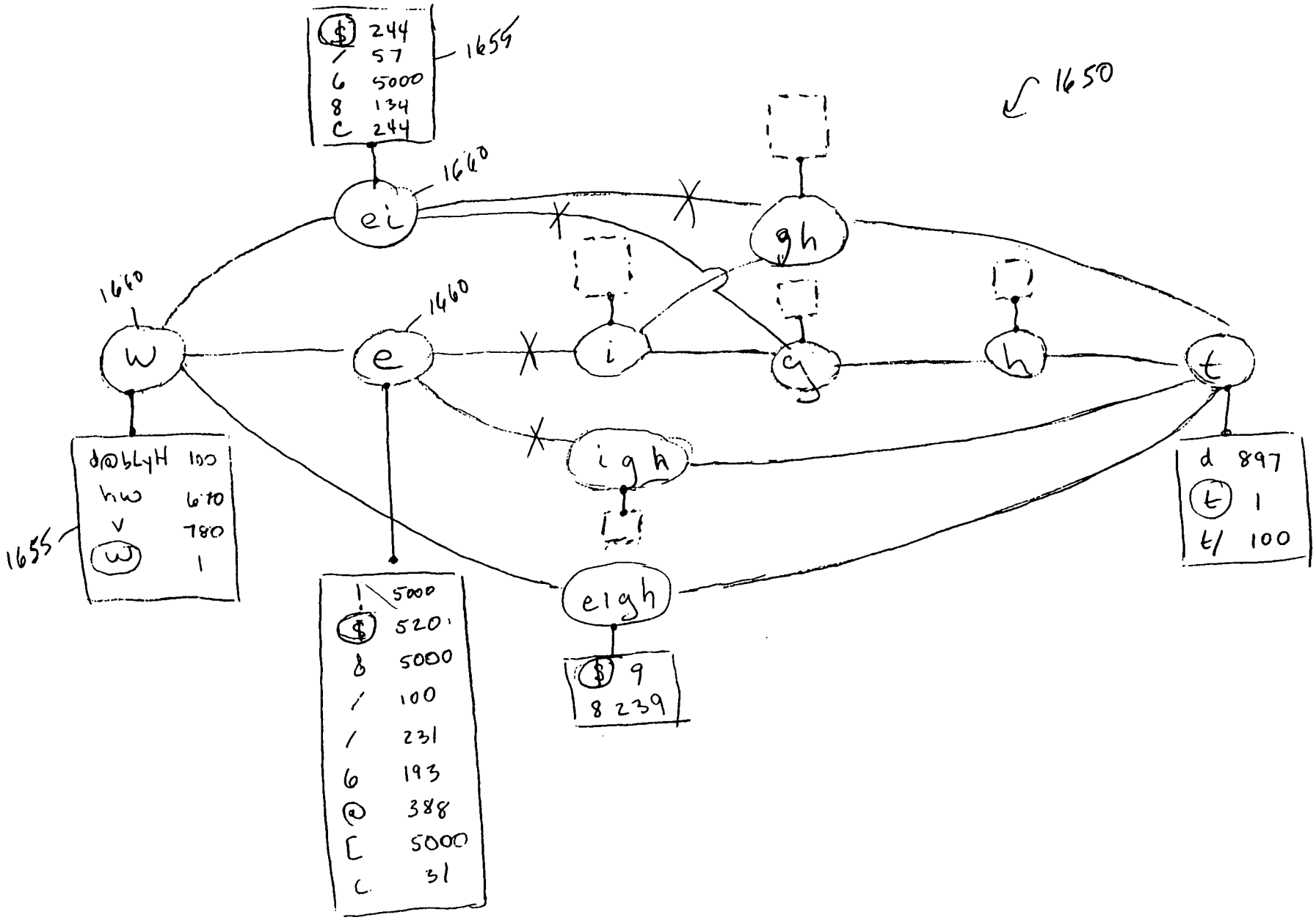

$ 244
/ 57
6 5000
8 134
C 244
1655
1650
1660
ei
gh
w
e
i
g
h
t
igh
d@6LyH 100
hw 6·10
v 780
w 1
1655
d 897
t 1
t/ 100
! 5000
$ 520·
8 5000
/ 100
/ 231
6 193
@ 388
[5000
C 31
eigh
$ 9
8 239

Fig. 16

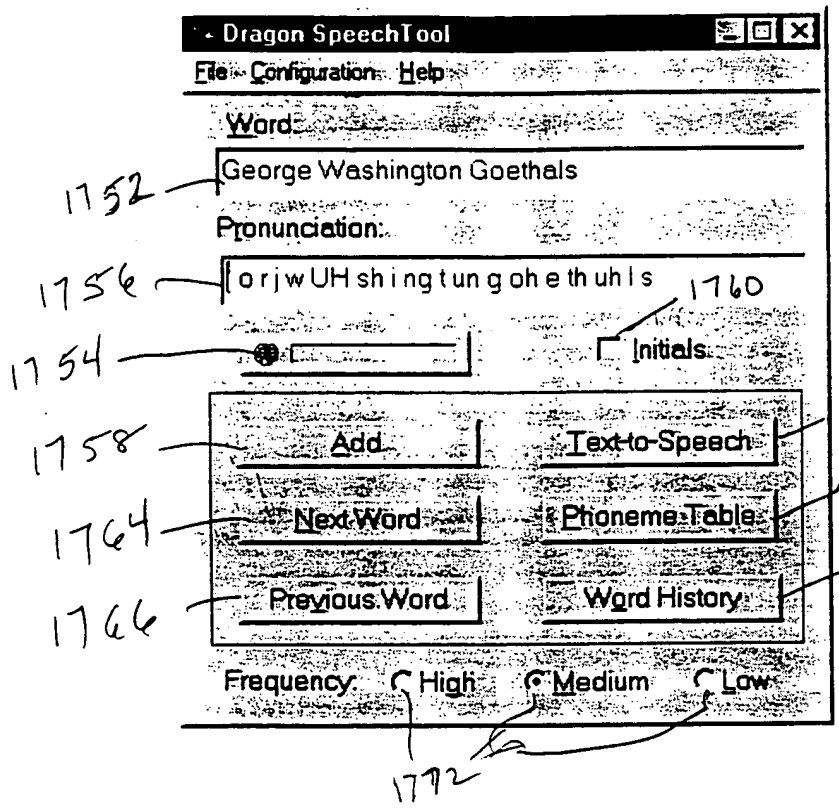

Dragon SpeechTool
File Configuration Help
Word:
George Washington Goethals
Pronunciation:
[o r j w UH sh i ng t un g oh e th uh l s
Initials
Add
Text-to-Speech
Next Word
Phoneme Table
Previous Word
Word History
Frequency: High Medium Low
1750
1752
1754
1756
1758
1760
1762
1764
1766
1768
1770
1772

Fig. 17

Fig. 18

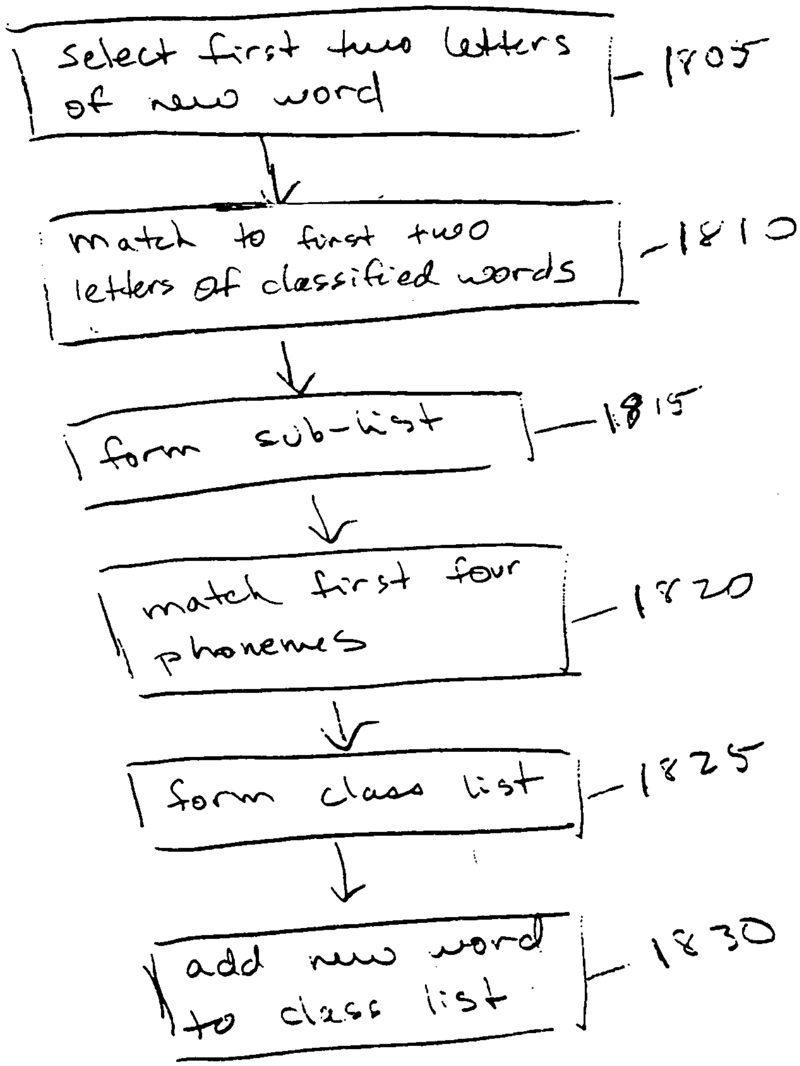

select first two letters of new word
1805
match to first two letters of classified words
1810
form sub-list
1815
match first four phonemes
1820
form class list
1825
add new word to class list
1830

Fig. 9

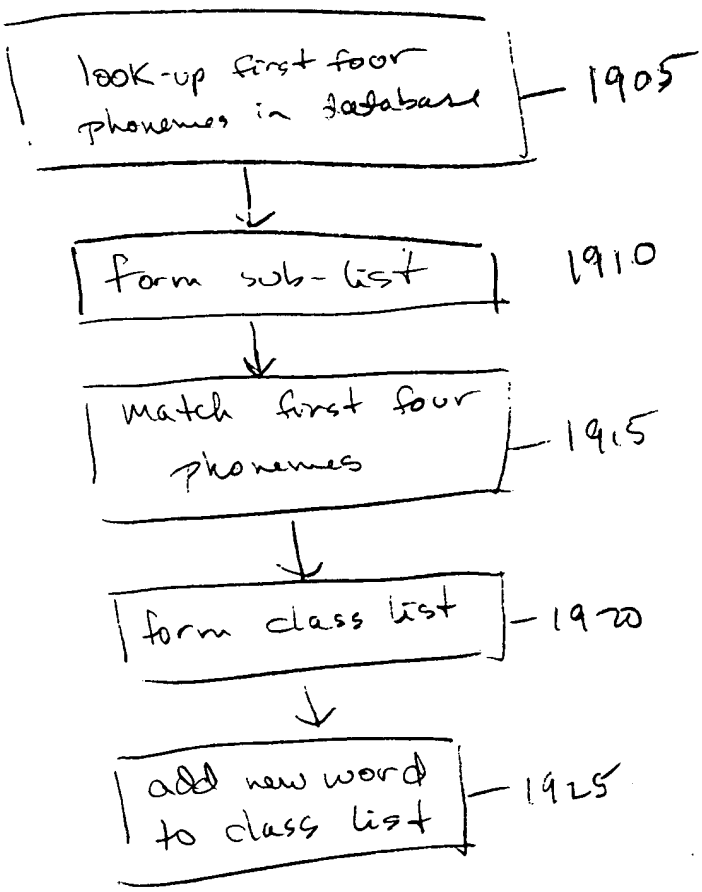


Fig 20

-	"aw"
!	"a"
$	"ey"
&	"ah"
)	"AH"
*	"ae"
,	"AE"
/	"ee"
6	"i"
8	"ie"
:	"oy"
<	"OY"
=	"ow"
?	"OW"
@	"uh"
A	"EY"
C	"C"
D	"x"
E	"El"
F	"ue"
H	"oo"
I	"IE"
L	"ul"
N	"ng"
O	"OH"
P	"ur"
S	"sh"
T	"th"
U	"UE"
V	"UR"
Z	"zh"
[	"o"
]	"oh"
a	"A"
b	"b"
c	"e"
d	"d"
e	"E"
f	"f"
g	"g"
h	"h"
i	"I"
j	"j"
k	"k"
l	"l"
m	"m"
n	"n"
o	"O"
p	"p"
q	"OO"
r	"r"
s	"s"
t	"t"
u	"UH"
v	"v"
w	"w"
y	"y"
z	"z"
(	"AW"
)	"um"
~	"un"